SHRI MATA VAISHNO DEVI UNIVERSITY, KATRA

School of Mechanical Engineering

B. Tech. (ME) Major Examination (Even) 2018-19

Entry No: | | | | | | | | | |

Date:

Total Number of Pages: [01]

Total Number of Questions: [07]

Course Title: Kinematics of Machines

Course Code: MEL 2015

Time Allowed: 03 Hours **Max Marks: [50]**

Instructions / NOTE:

i. Attempt All Questions.

ii. Support your answer with neat freehand sketches/diagrams, wherever appropriate.

Assume an appropriate data / information, wherever necessary / missing.

Q1. Describe the working of a band and block brake with the help of neat sketch. What is the difference between a brake and a clutch? **(7 marks)**

Q2. A cone clutch with asbestos friction lining transmits 30 Kw power at 500 rpm. The coefficient of friction is 0.2 & the permissible intensity of pressure is 0.35 N/mm^2. The semi-cone angle α is 12.5^0. The outer diameter is fixed as 300 mm. Assuming uniform wear theory, calculate (i) inner diameter, (ii) Face width of the friction lining (iii) force required to engage the clutch. **(9 marks)**

Q3. Explain the function of a governor with the help of neat sketch? **(4 marks)**

Q4. Explain in detail all the inversions of the slider-crank chain. **(4 marks)**

Q5. Draw the profile of a cam that gives a lift of 40mm to a rod carrying a 20mm diameter roller. The axis of the roller passes through the centre of the cam. The least radius of the cam is 50mm. The rod is to be lifted with simple harmonic motion in a quarter revolution and is to be dropped suddenly at half revolution. Determine the maximum velocity and maximum acceleration during the lifting. The cam rotates at 60 rpm. **(9 marks)**

Q6. The pulleys of two parallel shafts that 8 m apart are 600 mm and 800 mm in diameters and are connected by a crossed belt. It is needed to change the direction of rotation of the driven shafts by adopting the open-belt drive. Calculate the change in length of the belt. **(9 marks)**

Q7. A centrifugal clutch transmitting 255 Nm torque consists 4 shoes with $\mu = 0.35$. The inner diameter of the drum is 330 mm and the radial distance of shoes C.G. point from shaft axis is 140 mm. The transmitting power speed is 80 rad/sec. and clutch engage speed is 60 rad/sec. Find the mass of each shoe. **(8marks)**